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ABSTRACT

There has been great interest in disparities in revenues and expenditures of school districts based upon the school district's educational background, median family income, and racial makeup. Accordingly, this study correlates each school districts' expenditures, various supports, and revenues with the district's educational background, median family income, racial makeup, and dropout rate, using one-way analysis of variance. Findings, reported in a series of tables, include the following: (1) an inverse correlation between dropout rate and expenditures, except for general administration; (2) a correlation between median family income and educational revenues and expenditures, except in general administration and adult education; (3) higher expenditures for noninstructional expenses in school districts with 20-80 percent black students than in those with a lower or higher percentage of black students; (4) a correlation between the percentage of black students and the dropout rate. (TE)

A COMPARISON OF REVENUES AND EXPENDITURES AND MICHIGAN SCHOOL DISTRICTS, EDUCATIONAL BACKGROUND, MEDIAN FAMILY INCOME, RACIAL MAKEUP AND THE DROPOUT RATE

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A Comparison of Revenues and Expenditures and Michigan School Districts Educational Background, Median Family Income, Racial Makeup and the Dropout Rate

There has been great interest in disparities in revenues and expenditures of school districts based upon the school districts educational background, median family income, and racial makeup. In this study we analyzed these factors together with the black vs. white dropout rates for Michigan school districts. Our analysis both substantiated many facts of which most people are aware and found many relations which are not generally well known. It was felt that all facts and findings should be reported rather than concentrating on only those which are new or contradict popular perceptions.

DATA SOURCES

The data used in this study were obtained from the Michigan Department of Education. All data sets are organized by school district. The data sets are:

1. State Aid Database (Sadie Data) which includes school districts' revenues, expenditures and number of staff for the 1984-85 school year.
2. United States 1980 Federal Census data which includes information concerning school districts' education and income levels, and racial makeup.
3. 1982 and 1984 dropout data which includes the 9-12 grades' dropout data and number of students by race and gender.

VARIABLES

From the above data sets, variables that are appropriate for this study were selected and are listed in Table 1. This Table consists of an abbreviation of each variable, as it will appear throughout the rest of the paper, and its definition. All variables are arranged and analyzed by school district.

TABLE 1

Variable Abbreviations and Their Definition

Category	Abbreviation	Definition
Drop out	DROPRATE	Overall student dropout rate grade 9-12
	FDROPOUT	Female student dropout rate grade 9-12
	MDROPOUT	Male student dropout rate grade 9-12
	WDROPOUT	White student dropout rate grade 9-12
	BDROPOUT	Black student dropout rate grade 9-12
Supports	INBPSR	Instructional basic professional staff/1000 pupils
	INANPSR	Instr. additional need professional staff/1000 pupils
	INADPSR	Instr. adult education professional staff/1000 pupils
	INOTPSR	Instr. other professional staff/1000 pupils
	INNPSFR	Instr. nonprofessional staff/1000 pupils
	TOTINPR	Total instr. professional staff/1000 pupils
	PUPSUPR	Pupil support professional staff/1000 pupils
	SERPSFR	Service professional staff/1000 pupils
	SERNSFR	Service nonprofessional staff/1000 pupils
	GADMPSR	General adminstration professional staff/1000 pupils
	SHADPSR	School administration professional staff/1000 pupils
	TTSPSPR	Total support staff/1000 pupils
	BUSPSFR	Business professional staff/1000 pupils
	TTSTFPR	Total number of staff/1000 pupils
Revenues	RVLPPR	Local source revenue per pupil
	RVSPPR	State source revenue per pupil
	RVFPPR	Federal source revenue per pupil
	TTREVPR	Total Revenue per pupil
Expenditures	EXINBSR	Exp. for basic instruction per pupil
	EXINADR	Exp. for additional need instr. per pupil
	EXINATR	Exp. for adult education per pupil
	EXINUNR	Exp. for unclassified instr. per pupil
	EXINBNR	Exp. for instr. employee benefit per pupil
	EXINST	Total instr. related expenditure per pupil
	EXPSPR	Exp. for pupil support service per pupil
	EXINSPR	Exp. for instructional support per pupil
	EXGADMR	Exp. for general adm. support per pupil
	EXSADMR	Exp. for school adm. support per pupil
	EXBUSR	Exp. for business support per pupil
	EXCENTR	Exp. for central support per pupil
	EXOTHRR	Exp. for other support per pupil
	EXSPBNR	Exp. for support benefit per pupil
	EXCOMMR	Exp. for community service per pupil
	TTEXPPR	Total expenditure per pupil

Education Level	PCMPEL	Percent of not completing high school at age 25+
	PCMPHS4	Percent of completing high school at age 25+
	PCMPCOL1	Percent of completing 1-3 year college at age 25+
	PCMPCOL4	Percent of completing 4 yr. col. or higher at 25+
Racial makeup	PBLACK	Percent of black pupils of a school district
Income	MFINC	Median family income in dollars

METHODOLOGY

The correlations between a school districts' expenditures, various supports, and revenues and a district's educational background, median family income, racial makeup and its dropout rate were analyzed. The educational background, median family income, and racial makeup were grouped by their empirical distribution. Using one-way analysis of variance, expenditures, various supports and revenues were compared with the grouped variables. Among the grouped variables, a school district's racial makeup and its dropout rate were analyzed further.

FINDINGS

A. Educational Background

A district's percentage of people over 25 years of age not completing high school (PCMPEL) and its percentage completing at least four years of college (PCMPCOL4) were analyzed and is summarized on Table 2. As the percentage of people not completing high school increases, all important expenditures in education tend to decrease, except for general administration (EXGADMR) which increases significantly. Additional need instructional expenditure (EXINADR), business expenditure (EXBUSR), adult education expenditure (EXINATR), and community services expenditure (EXCOMMR) are unrelated to the percentage of people not completing high school. On the other hand, as the number of people over 25 completing at least four years of college increases, all important expenditures related to education tend to

TABLE 2

ANOVA for Comparing Expenditures, Instructional Supports and Revenues with the Percentage of Black Students, Education Levels and Family Income

	PBLACK	PCMPEL	PCMPCOL4	MFINC
EXINBSR	NS	*** - Q	*** +	*** + Q
EXINADR	*** +	NS	* +	** +
EXINST	** + Q	*** - Q	*** +	*** + Q
EXINSPR	*** +	*** - Q	*** +	*** +
EXINATR	NS	NS	NS	NS
EXINBNR	*** + Q	*** -	*** +	*** + Q
EXPSPR	*** + Q	*** - Q	*** +	*** + Q
EXGADMR	NS	** +	NS	*** - Q
EXSADMR	* +	*** -	*** +	*** +
EXBUSR	** +	** Q	*** +	*** Q
EXCENTR	*** +	*** - Q	*** + Q	*** + Q
EXSPBNR	*** +	* -	*** +	*** + Q
EXCOMMR	***	NS	* +	NS
TTEXPPR	** +	*** - Q	*** +	*** + Q
INBPSR	*** -	* Q	* Q	*** - Q
INANPSR	*** +	NS	NS	NS
TOTINPR	NS	** +	* Q	*** -
MFINC	*** - Q	*** -	*** +	-----
RVLPPR	NS	*** - Q	*** + Q	*** + Q
RVSPPR	*** +	** + Q	*** -	*** Q
RVFPPR	*** +	*** +	NS	*** -
TTREVPR	** +	*** Q	*** + Q	*** Q
PCMPEL	*** + Q	-----	-----	*** -
PCMPCOL4	*** - Q	-----	-----	*** +

NS: Non-significance
*: 5% significance
**: 1% significance
***: .1% significance
+: positive linear relationship
-: negative linear relationship
Q: quadratic relationship

increase except for general administration (EXGADMR) which is unrelated to college education.

The relationships of the basic instructional support (INBPSR) and the total instructional support (TOTINPR) to a districts' educational level is quadratic. Districts with both lower and higher educational levels tend to spend more for instructional support, (Fig. 1), than those with average levels.

Districts with lower educational achievement tend to receive more State (RVSPPR) and Federal revenues (RVFPPR). An interesting finding is that the relationships of both local revenue (RVLPR) and total revenue (TTREVPR) to the education level are also quadratic (Fig. 2). It thus appears that school districts with low education, low median family income, and high education, high income spend relatively more on education. The low education, low median family income districts are particularly noteworthy because their expenditures represent the largest proportional commitment. However, this may also be due to more industries in these districts (or other factors of which the authors are unaware).

B. Median Family Income

As the median family income (MFINC) of a district increases, more money is spent in all areas of education except general administration (EXGADMR), which decreases significantly, and adult education (EXINATR), which does not change. Another way of stating this is that poorer districts spend more on general administration and less on other areas of education. Interestingly, the higher the median family income of a district, the fewer the people per 1000 pupils that are involved in basic instruction professional staff (INBPSR). Since the total instructional staff is primarily a combination of

Fig. 1 Total instructional professional staff/1000 pupils vs. % of population 25 years or older completing at least 4 years of college.

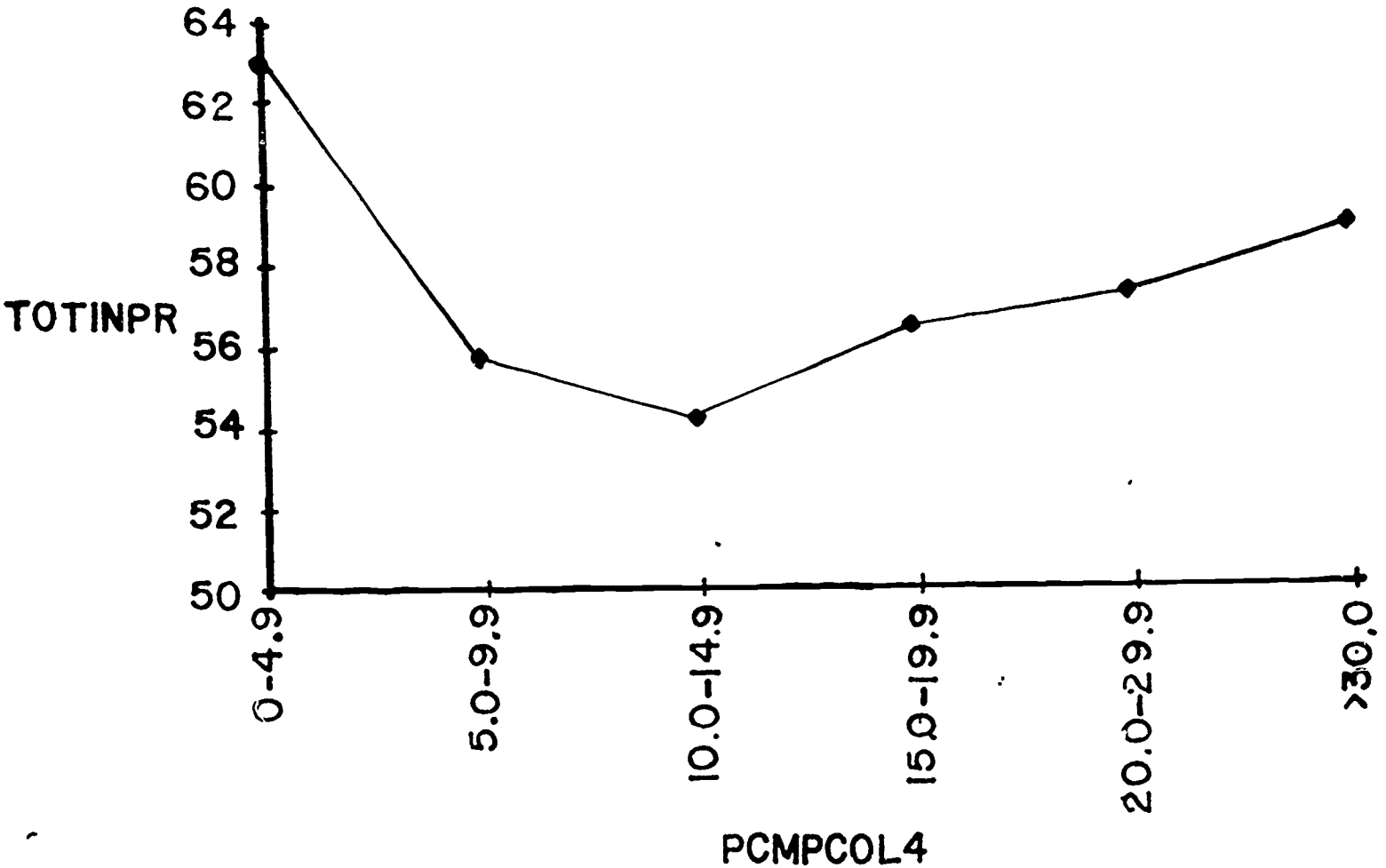
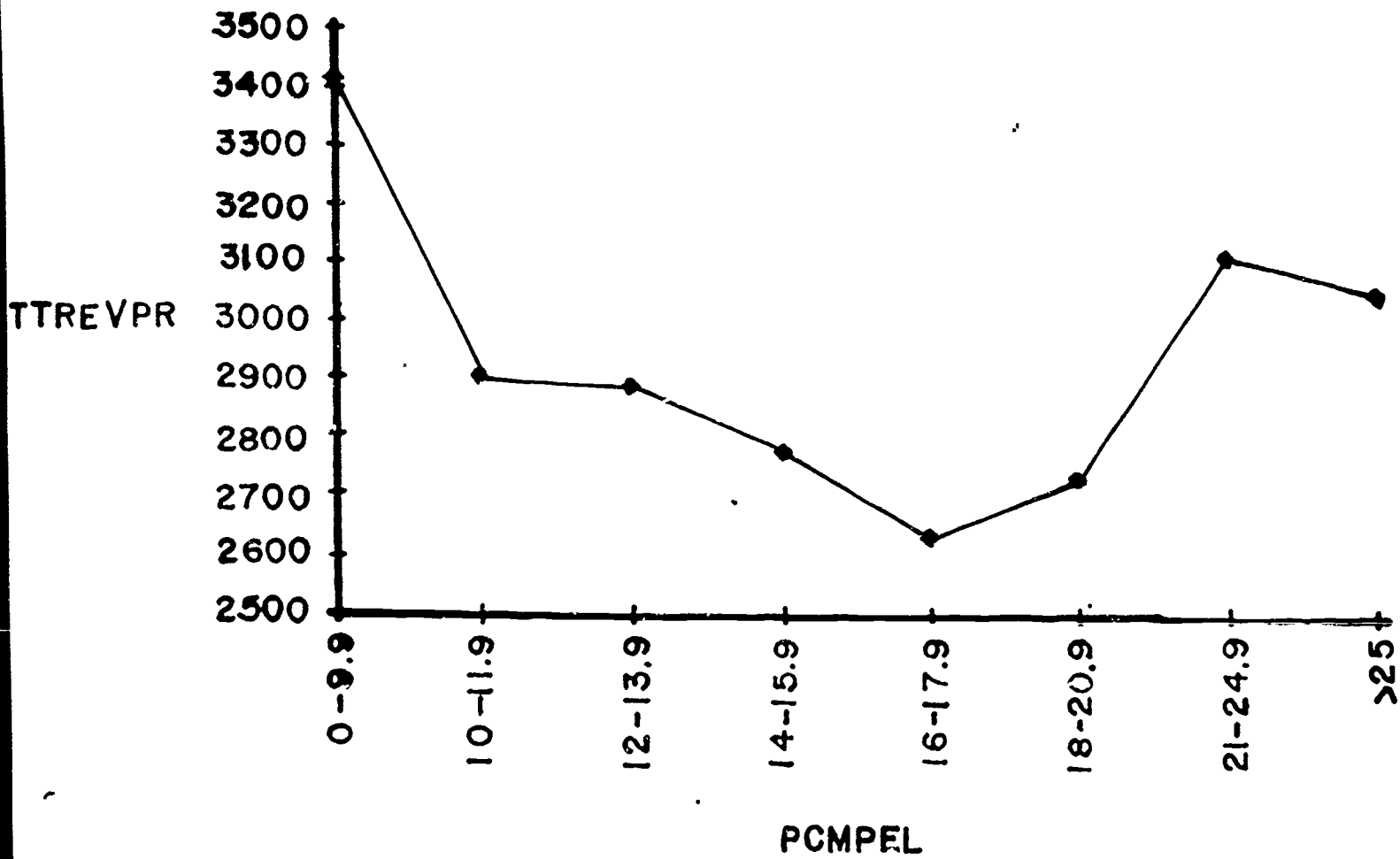


Fig. 2 Total revenue per pupil vs. % of population 25 years or older not completing high school.



basic and additional instructional professional staff, and additional instructional professional staff (INANSPR) is not related to a district's median family income level, the total instructional staff also shows a negative linear trend to a district's income level.

As one might expect, local revenue (RVLPPR) is positively correlated with a district's median family income level. Higher amounts of federal revenues, however, are associated with lower amounts of local revenue, median family income and educational levels (Table 2). An interesting finding is that districts at lower and higher median family income levels receive less state revenue (RVSPPR) than districts at middle family income levels (Fig. 3). The relationship between the median family income and the districts total revenue (TTREVPR) is quadratic. School districts with median family incomes of less than $14,000 and more than $24,000 have significantly higher total revenue (Table 2 Fig. 4). The reason for this is that districts with the lowest income have relatively high local and federal revenues, and the high income districts have very high local revenue, state revenue while higher for middle income groups does not totally compensate for both low federal and local revenue.

C. Racial Makeup

The relationship of districts' percentage of black students and its expenditures, instructional supports, and revenues are analyzed (Table 2).

As the percentage of black students in a school district increases, basic instructional expenditure (EXINBSR) does not change significantly (Table 2). Additional instructional expenditure (EXINADR) increases until the school is about [illegible] black and does not change significantly thereafter. For total instructional expenditure (EXINST), however, school districts with 20-80

Fig. 3 State revenue per pupil vs. the median family income of a school district.

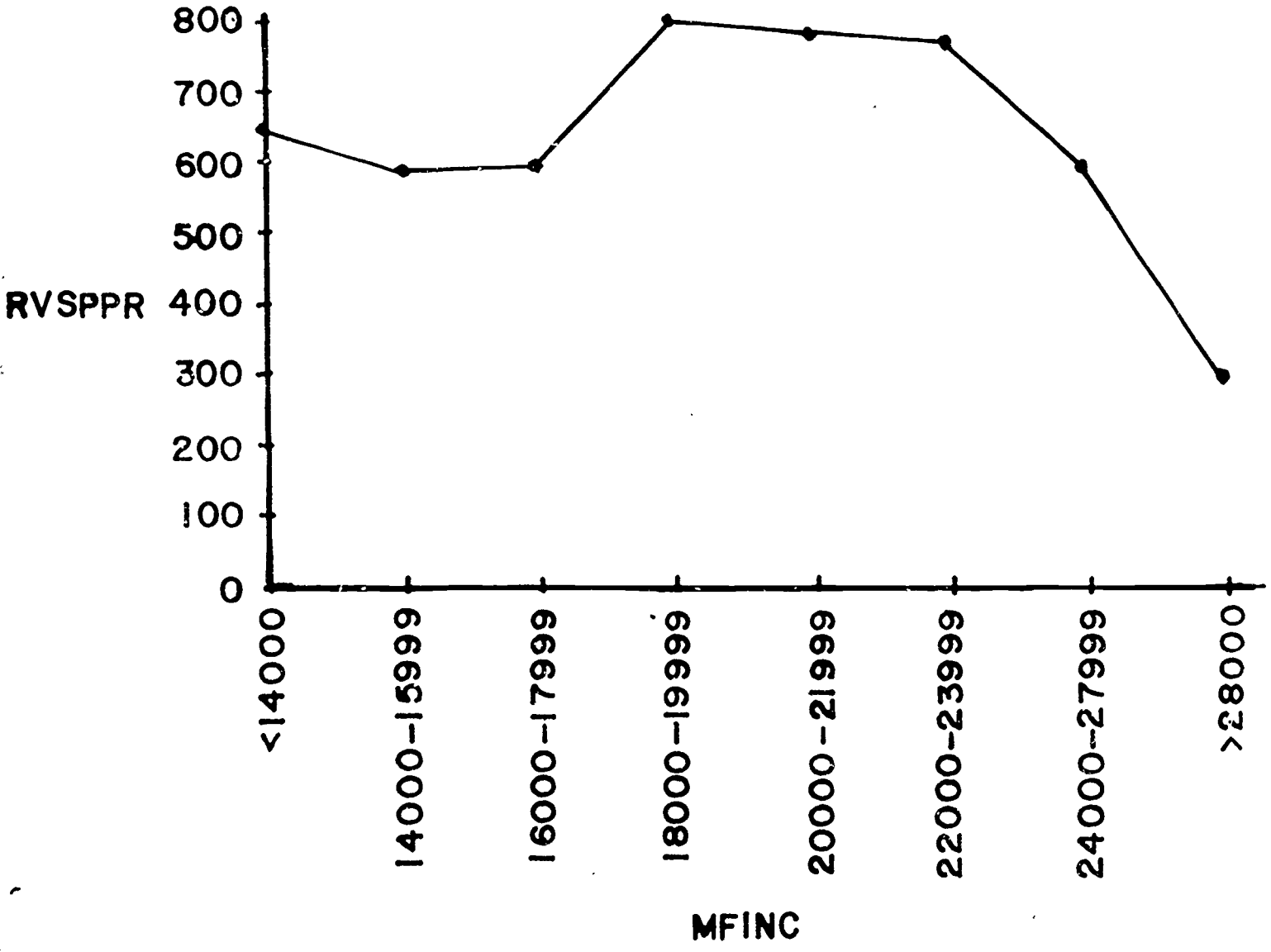
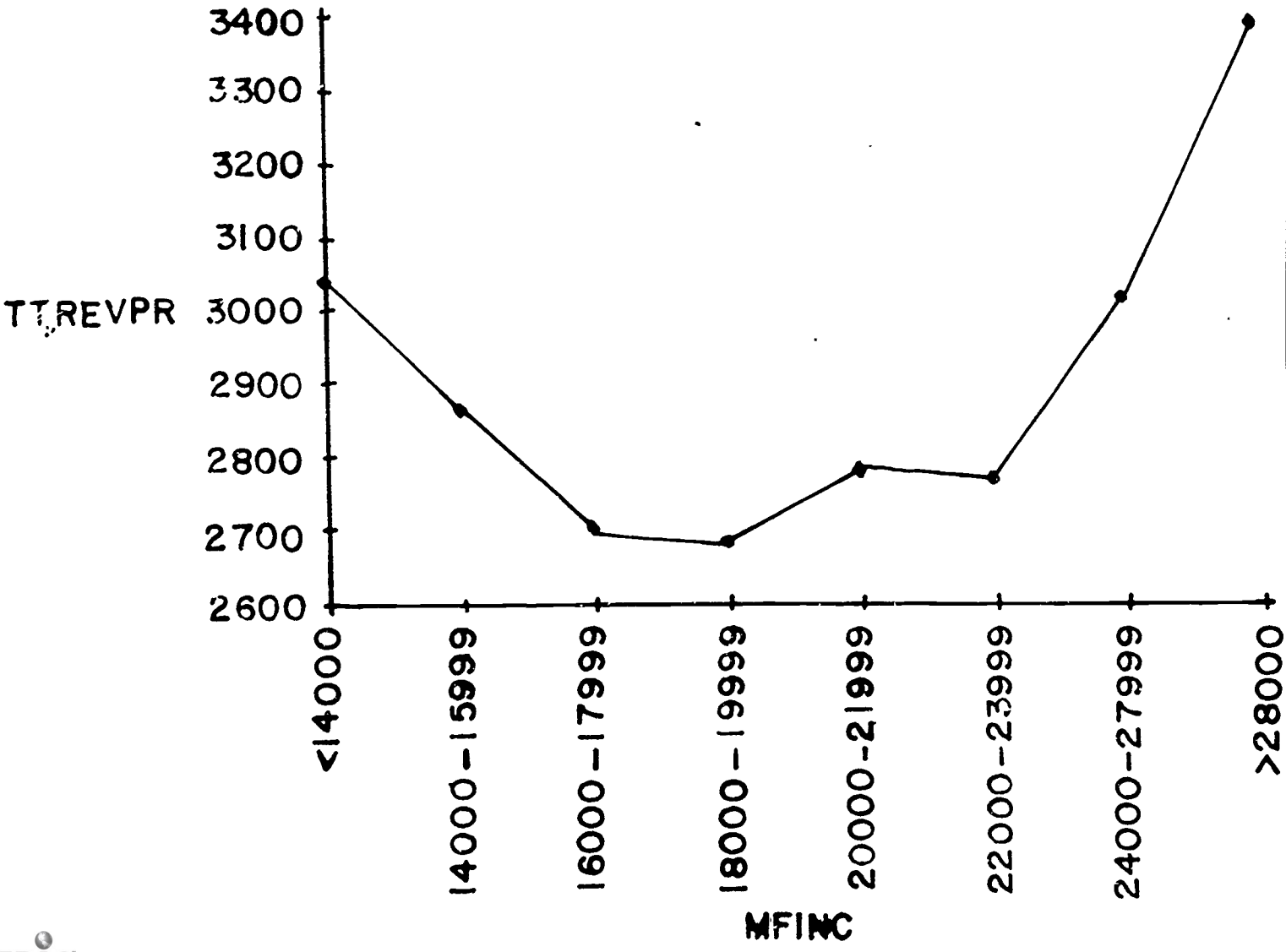


Fig. 4 Total revenue per pupil vs. the median family income of a school district.



percent black students spent the most. No pattern of the percentage of black students in a school district and instructional support expenditure (EXINSPR) could be found. School districts with 30-40 percent and 98 percent or more black students spent substantially more (2.5-3 times) than the average of other school districts for adult education (EXINATR).

School districts with 40-60 percent black students spent significantly more on employee benefits (EXINBNR) than other districts, while school districts with 30-80 percent black students spent more for pupil support (EXPSPR). School districts with 40-60 percent black students spent considerably more for general administration (EXGADMR) than others, while school districts with 40-80 percent black students spent considerably more for school administration (EXSADMR) and business support (EXBUSR) than other school districts. School districts with 60-80 percent black students spent significantly more on central support (EXCENTR), support benefit (EXSPBNR), and community service (EXCOMMR) than other school districts.

In summation, school districts with 20-80 percent black students seem to have higher expenditure for non-instructional expenses than school districts with either a lower or higher percentage of black students. Total student expenditure (TTEXPPR) and, as mentioned earlier, total instructional expenses are also greater for these groups of school districts.

With respect to instructional support, as school districts have increasing percentages of black students, basic instructional support staff (INNBPSR) decreases significantly, additional staff support (INANPSR) increases significantly, and the total support which is a combination of the above (TOTINPR) does no change significantly (Table 2).

As the percentage of black students in a school district increases, the median family income (MFINC) decreases (Table 2), and local revenue (RVLPPR), while relatively constant, fluctuates, reaching a peak with about 40-80 percent black students. This occurs despite a decreasing median family income level. For districts with more than 80 percent black students, local revenue plummets (Fig. 5) despite only a modest decrease in median family income. State revenue (RVSPPR) also fluctuates until a school district's population is around 80 percent black and then it skyrockets (Fig. 6). An analysis of the data appears to indicate that State revenue increases whenever local revenue decreases (correlation coefficient for this is 0.72 which is significant at the 0.1 percent level) regardless of the median family income of the district. Federal revenue (RVFPPR) increases as the percentage of black students increases (Table 2). Total revenue (TTREVPR), while fluctuating, reaches a peak for school districts with 40-80 percent black students. (Fig. 7).

Closer examination of the data reveals one additional fact, school districts with less than one percent black students have, on the average, a slightly lower median family income and also a slightly lower percentage of the population over 25 years of age who have received at least four years of college. Despite their lower income, they receive the least state and federal support, and despite comparatively high local revenues, they receive the lowest average total support of any group.

D. Black and White Dropout Rates as a Function of a School Districts Racial Makeup

In general, the greater the percentage of black students in a school district the greater the dropout rate. This trend continues until the district is predominately black (98 percent or more). The seemingly obvious

Fig. 5 Local revenue per pupil vs. % of black students in a school district.

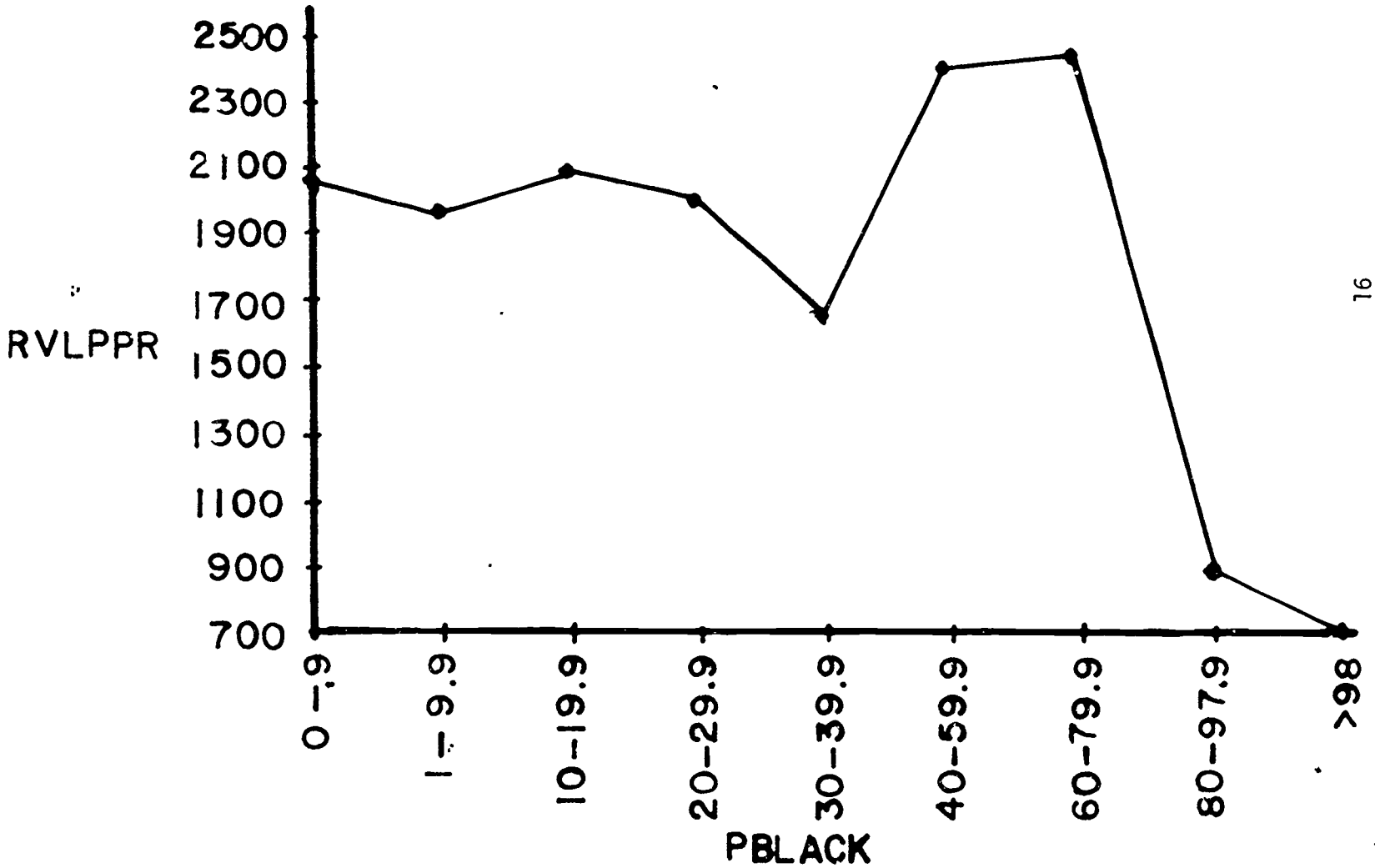


Fig. 6 State revenue per pupil vs. % of black students in a school district.

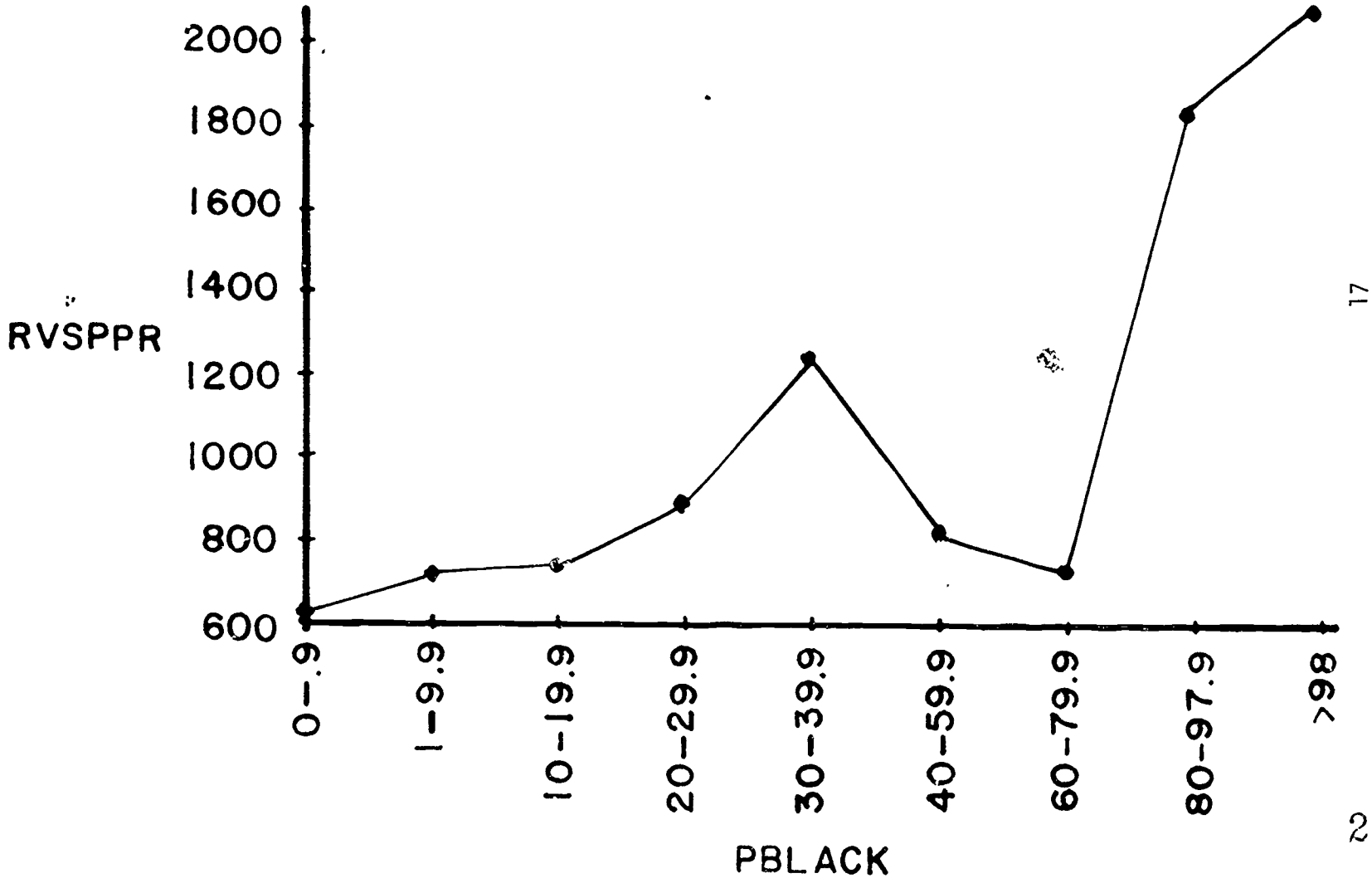
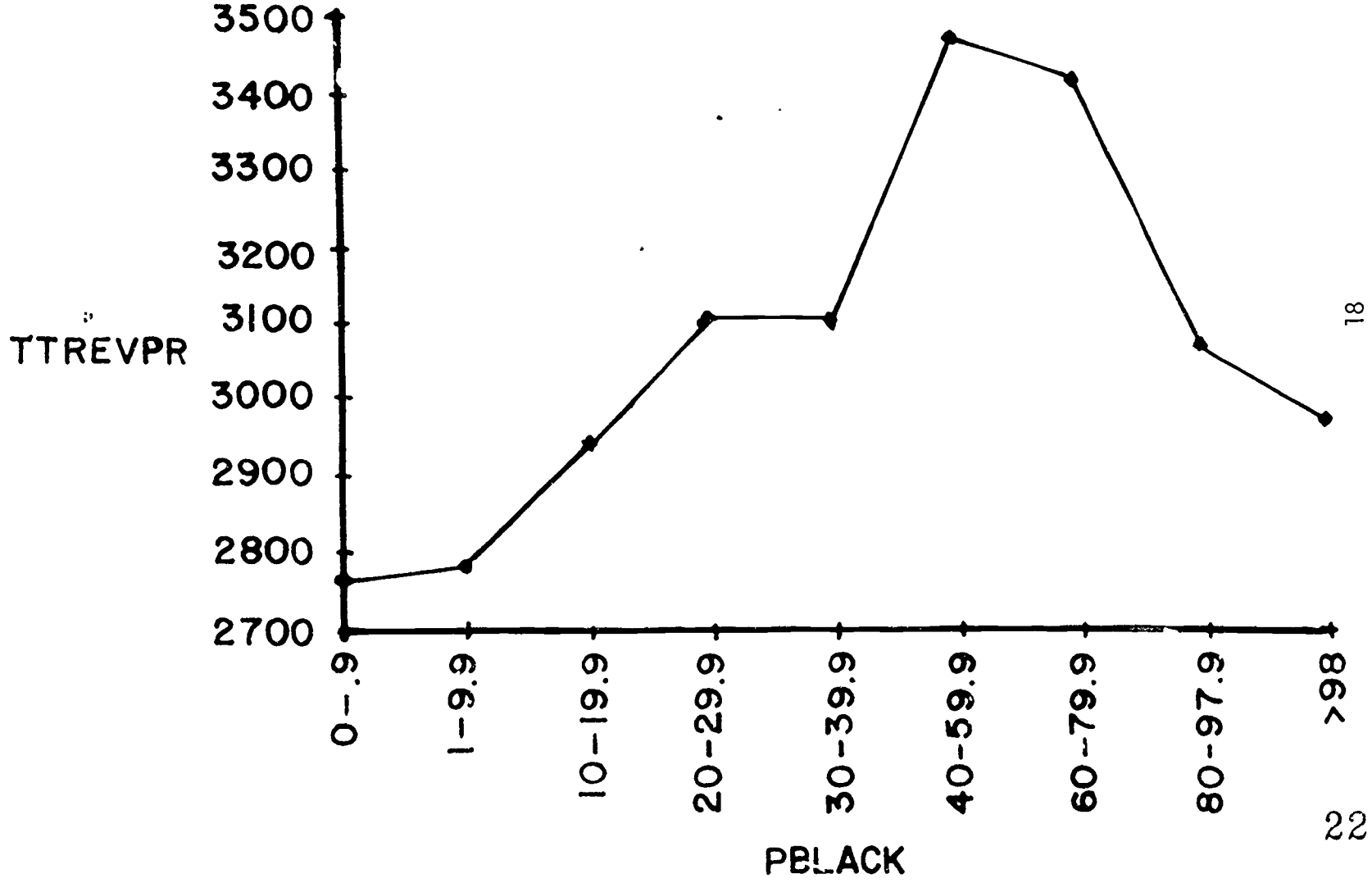


Fig. 7 Total revenue per pupil vs. % of black students in a school district.



conclusion is that this result is due to black students who drop out at a faster rate. Further analysis shows this conclusion to be false. Table 3 shows that in school districts, with more than 1 percent black students whenever there is a significant difference between the white and black student dropout rates, the white students dropout rate is higher. However, it should be noted that schools that are made up of primarily white students (less than 1 percent black students) have the lowest dropout rates. As a school district becomes more fully integrated, the dropout rate for white students increases (Table 3). As a school district becomes more integrated the dropout rate of black students also tends to increase, though in an irregular fashion until it is largely black (98 percent or more) then it seems to drop substantially.

In Michigan only a few school districts have more than 98 percent black students. Thus, while the decrease in the dropout rate for these districts is dramatic (Table 3) it is not statistically significant. Substantiation of the drop off in the dropout rate as school districts percentage of black students exceed 98 percent together with the reasons for the increase in the dropout rate as school districts percentage of black students increases below this rate are areas deserving further investigation.

TABLE 3

Comparison of the Dropout Rates Between White and Black Students by Percentage of Black Students

% of black students in a school district	Black	sd	White	sd	N	t-test
1 (0-1)	-----	---	3.39	2.5	905	------
2 (1-10)	5.33	8.5	4.56	2.5	148	NS
3 (10-20)	6.85	5.2	5.99	2.5	23	NS
4 (20-30)	8.58	5.1	9.13	2.2	15	NS
5 (30-40)	8.22	6.3	8.25	7.8	15	NS
6 (40-60)	7.27	3.8	10.39	4.1	14	**
7 (60-80)	6.99	3.7	11.99	5.5	10	*
8 (80-98)	11.0	3.2	20.59	7.1	4	a
9 (98)	5.3	4.4	-----	---	4	------

NS: Non-significance

a: 10% significance

*: 5% significance

**: 1% significance